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From: Lawrence E. Laubscher, Jr.

In re application of

Rickard M. VON WURTEMBERG et al.

Group Art Unit: 2828

Application No. 09/438,955

Examiner: Cornelius Jackson

Filed: November 12, 1999

**For: BOTTOM EMITTING VCSEL WITH MONITOR EMISSION THROUGH
TOP MIRROR**

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PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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REQUEST FOR RECONSIDERATION

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GAU 2828 - AF
Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action mailed December 17, 2002, applicants respectfully request reconsideration of the rejection of claims 18-29, which remain pending herein.

The applicants respectfully disagree with the Examiner that the reference to light output port constitutes new matter since the expression is merely a description of the function of the hole as described in the specification and illustrated in the drawings. A port is defined in the dictionary as an opening for the passage of air, water etc. That is precisely what the opening referenced 32' in Figure 3 is. The arrow clearly represents the light exiting from the device as confirmed by lines 8, 9 of page 3, where the specification states that the "light emitted through the less reflecting mirror 26 passes through a hole 32' in the substrate". What is this if it is not a "port"?

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In *In re Wofensperger*, 133 USPQ, the CCPA made is quite clear that the drawings can serve as a basis for amendment. Referring to the drawings, the CCPA said, "Whatever it does disclose may be added to the specification in words without violation of the statute and rule which prohibit "new matter"". Clearly the light aperture 32' in Figure 3 constitutes a *port*. Moreover, it is quite clear from the CCPA's decision in *In re Smythe* 178 USPQ 279 that the applicants are fully entitled to claim an output port based on the disclosure. In *In re Smythe*, the CCPA provided the following example to illustrate the point:

"If the original specification of patent application on the scales of justice disclosed only a 1-pound "lead weight" as a counterbalance to determined the weight of a pound of flesh, we do not believe the applicant should be prevented, by the so called "description requirement" of the first paragraph of § 112 or the prohibition of new matter of § 132, from later claiming the counterbalance as a "metal weight" or simply as a 1-pound weight, although both "metal weight" and weight" would indeed be progressively broader than "lead weight", including even such an undisclosed, but obviously art-recognized equivalent, "weight" as a pound of feathers. The broader claim language would be permitted because the description and use and the function of the lead weight as a scale counterbalance in the whole disclosure would immediately convey to any person skilled in the art the knowledge that the applicant invented a scale with a 1-pound counterbalance weight, regardless of its composition".

The above decision goes much further that the situation in question, where the applicants have merely referred to an element that clearly is a light output port explicitly as such.

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The Examiner's rejection of claim 18 under 35 USC 102 is respectfully traversed as unfounded and inconsistent with the case law.

With regard to the rejection under 35 USC 102, it is respectfully submitted that Kim does not meet the strict requirements for anticipation.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, described in a single prior art reference." *Verdegaard Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051.

In the applicant's respectful submission, the Examiner has fatally misinterpreted Kim. Claim 1 calls for an output port of the side of the stack adjacent the low reflectivity mirror. This must be the main output of the device, which in Kim would be the hole in contact layer 11. Kim makes it clear that the "laser beam" constitutes the output of the device.

Claim 1 calls for an ohmic contact adjacent the high reflectivity mirror. The Examiner incorrectly identifies element 30 of Kim as an "ohmic contact". Element 30 according to line 29, col 3 of Kim, is a "light scattering portion". Nowhere does Kim say that it is an "ohmic contact". Moreover, Kim states at line 32, col. 3, that the light scattering layer 30 is formed by "an oxidation process", so it could not possibly be an "ohmic contact" as asserted by the Examiner. Oxidized materials are insulating, not conducting. Contrary to the Examiner's assertion, it is respectfully submitted that Kim does not show an ohmic contact on the side of the high reflectivity mirror.

Moreover, Kim expressly states that his monitor diode 14, which contrary to the invention as claimed is internal to the device, is located between the "junction surface of a P-type substrate 14 and an N-type lower mirror 123" (see col. 3, lines 15 - 17). There is no ohmic contact, and in particular no suggestion of an ohmic contact on the opposite side of the laser stack to that from which the main laser beam emerges that is photon transparent. Such a

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construction is necessary to permit the use of an external photo detector, which has other advantages.

Contrary to the Examiner's assertion, Kim does not disclose a device capable of working with an external photo detector, namely one which is separate from the VCSEL chip (see line 12, page 3 of the specification). The monitor 15 in Kim is inherently integrated into the device and would not be regarded as external. Therefore it cannot be even regarded as inherent in Kim that a photon transparent contact is present.

In summary, claim 18 covers essentially two embodiments, neither of which is anticipated by Kim. In a top emitting VCSEL, the laser light is emitted from the epi layers as shown by Kim. In the invention, the monitor light passes out of the device to an external detector through a photon transparent contact. This is not shown in Kim because in Kim the monitor light does not pass through an ohmic contact. It is intercepted first by the monitor 15 built into the device. So Kim does not disclose, as required by claim 18, a photon transparent ohmic contact on the side of the stack adjacent the high reflectivity mirror. As pointed out, element 30 as asserted by the Examiner, since it is made by an oxidation process, cannot provide such an ohmic contact.

In another embodiment, not shown by Kim (The applicants respectfully disagree with the Examiner's suggestion that upside down, contact 11 could be regarded as the "substrate". The word substrate is a well understood term of art in this field, and no person skilled in the would seriously regard contact 11 as a substrate), the VCSEL is a bottom emitting VCSEL. In this case, the laser light exits through the substrate, and the photon transparent contact is on the other side (the epi layer side). However Kim is interpreted, it cannot anticipate this structure either since there is still no photon transparent contact on the side of the stack adjacent the high reflectivity mirror.

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In summary, Kim fails to disclose the required photon transparent ohmic contact on the side of the high reflectivity mirror, namely the side not intended to emit light, but from which nevertheless a small amount of light will leak out. Such a feature cannot be regarded as inherent in Kim since the teaching of Kim is fundamentally different from the present invention. Kim builds his monitor into the device. It is an integral part of the device. Kim does not therefore contemplate a transparent ohmic contact as required by claim 18.

Claim 18 cannot be considered *prima facie* obvious over Kim under 35 USC 103. In order to establish a *prima facie* case of obviousness under 35 USC 103(a),

"the prior art reference (or references when combined) must teach all the claim limitations". See MPEP 2143. (Emphasis added)

Clearly, Kim fails to teach all the claim limitations for the reasons stated above. The same is true of Lin and the other references. Lin only teaches an SEL wherein the monitoring and emission take place on the same side of the active device. In Lin, there is no teaching of the monitoring light coming out from the opposite side as the emission light, and no teaching either inherently or otherwise, of an ohmic contact on the high reflectivity side that is photon transparent.

The applicants respectfully submit that the Examiner's rejection of claim 19 is in error for the same reason as claim 18. Kim does not teach a photon transparent ohmic contact on the side of the high reflectivity mirror. As pointed out above, element 30 is not, and cannot be, an ohmic contact.

Moreover, with regard to claim 20, it is respectfully submitted that the Examiner's use of the "design choice" rejection is improper. The Examiner has failed to show that it is common practice to use Indium Tin Oxide for contacts on VCSELs, and such rejection is respectfully traversed.

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With regard to the Examiner's rejection of claim 23, it is respectfully submitted that this constitutes another misuse of the "design choice" rejection. Although obviously devices can be placed in any orientation, the term bottom emitting VCSEL has become recognized as a term in the art. A quick search on the Google search engine shows a large number of references to "bottom emitting" VCSELS. Because such devices are normally epitaxially grown on a substrate with the substrate at the bottom, a device that emits through the substrate is known as "bottom emitting" even when turned upside down as shown in Figure 3, where the substrate 22 is actually shown on top. It is, in the applicant's respectful submission, improper to suggest that one skilled in the art would regard Kim as a "bottom emitting" VCSEL, when clearly it is a top emitting VCSEL. The Examiner must interpret disclosures in a manner in which they would be interpreted by persons skilled in the art. No-one skilled in the art would seriously suggest contact 11 of Kim constitutes a "substrate" as the term is used in the art, especially when the substrate 14 is clearly shown and described in the specification. Moreover, as pointed out with reference to claim 18, Kim lacks teaching of an ohmic photon transparent substrate on the side of the high reflectivity mirror.

The rejection of claims 11-13 and 15-17 is not understood since these claims are not pending in the application.

The Examiner's rejections are therefore respectfully traversed. Furthermore, in the event that the Examiner does not agree with the applicant's submission, he is respectfully requested to withdraw the finality of this office action in view of the fundamental flaw in the Examiner's interpretation of the primary reference where he incorrectly refers to the light scattering element 30, which is made by an oxidation process, as an "ohmic contact". It is respectfully submitted that this misinterpretation is so fundamental to a proper analysis of the prior art that it would be

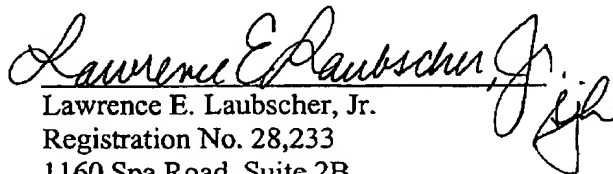
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inappropriate for the Examiner to maintain his rejection without giving the applicant an opportunity to fully consider any alternative position that the Examiner may wish to take.

Accordingly, reconsideration and withdrawal of all grounds of rejection and allowance of claims 18-29 is courteously solicited.

Respectfully submitted,

April 17, 2003


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